

BUREAU OF AIR QUALITY PLANNING

901 South Stewart Street, Suite 4001 • Carson City, NV 89701-5249 phone: 775-687-9350 • www.ndep.nv.gov/baqp • fax: 775-687-6396

Facility ID No. A0390

Permit No. AP1041-2255

MERCURY OPERATING PERMIT TO CONSTRUCT

Issued to: Hycroft Resources & Development, Inc. (Hereinafter referred to as *the Permittee*)

Mailing Address: P.O. BOX 3030, WINNEMUCCA, NV 89446

Physical Address: 55 MILES WEST OF WINNEMUCCA, NV ON JUNGO ROAD **General Facility Location:** SECTIONS 23 – 27, AND 34 - 36, T 35N, R 29E

SECTIONS 19, 20, AND 31, T 35N, R 30E

MDB&M (HA 28 BLACK ROCK DESERT) (HUMBOLDT COUNTY)

Thermal Unit List: (2 Thermal Units)			
A. System 01 – Mercury Retort			
TU 4.001	Mercury Retort, manufactured by Summit Valley Equipment & Engineering, LLC., model number 40MR1E		
B. System 02 – Furnace			
TU 4.002	Smelting Furnace, manufactured by Summit Valley Equipment & Engineering, LLC., model number MF 101		



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Section I. General Conditions

The Permittee must comply with, but is not limited to, all conditions of Nevada Administrative Code (NAC) 445B.3611-3689 "*Nevada Mercury Air Emissions Control Program*", inclusive.

A. Records Retention. NAC 445B.3679.2(a)

The Permittee of a Mercury Operating Permit to Construct shall retain records of all required monitoring data and support information for (5) years after the date of the sample collection, measurement, report or analysis. Supporting information includes, without limitation, all records regarding calibration and maintenance of the monitoring equipment and all original strip-chart recordings for continuous monitoring instrumentation.

B. Severability. NAC 445B.3679.2(b)

Each of the conditions and requirements of the Mercury Operating Permit to Construct is severable and, if any are held invalid, the remaining conditions and requirements continue in effect.

C. <u>Compliance/Noncompliance.</u> NAC 445B.3679.2(c)

The Permittee must comply with all conditions of the Mercury Operating Permit to Construct. Any noncompliance constitutes a violation and is grounds for:

- 1. An action for noncompliance;
- 2. The revoking and reissuing, or the terminating of the Mercury Operating Permit to Construct by the Director; or
- 3. The reopening or revising of the Mercury Operating Permit to Construct by the holder of the Mercury Operating Permit to Construct as directed by the Director.

D. Defense to Noncompliance. NAC 445B.3679.2(d)

The need to halt or reduce activity to maintain compliance with the conditions of the Mercury Operating Permit to Construct is not a defense to noncompliance with any conditions of the Mercury Operating Permit to Construct.

E. <u>Cause.</u> NAC 445B.3679.2(e)

The Director may revise, revoke and reissue, reopen and revise, or terminate the Mercury Operating Permit to Construct for cause.

F. Property Rights/Exclusive Privilege. NAC 445B.3679.2(f)

The Mercury Operating Permit to Construct does not convey any property rights or any exclusive privilege.

G. <u>Information Request from Director.</u> NAC 445B.3679.2(g)

The Permittee shall provide the Director, in writing and within a reasonable time, with any information that the Director requests to determine whether cause exists for revoking or terminating the Mercury Operating Permit to Construct or to determine compliance with the conditions of this Mercury Operating Permit to Construct.

H. Right to Entry. NAC 445B.3679.2(h)

The Permittee shall allow the Director or any authorized representative of the Director, upon the presentation of credentials, to:

- 1. Enter upon the premises of *the Permittee* where:
 - a. The thermal unit that emits mercury is located;
 - b. Activity related to mercury emissions is conducted; or
 - c. Records are kept pursuant to the conditions of the Mercury Operating Permit to Construct.
- 2. Have access to and copy, during normal business hours, any records that are kept pursuant to the conditions of the Mercury Operating Permit to Construct;
- 3. Inspect, at reasonable times, any facilities, practices, operations, or equipment, including any equipment for monitoring or controlling air pollution, that are regulated or required pursuant to the Mercury Operating Permit to Construct; and
- 4. Sample or monitor, at reasonable times, substances or parameters to determine compliance with the conditions of the Mercury Operating Permit to Construct or applicable requirements.

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Section I. General Conditions (continued)

I. Certify True and Accurate. NAC 445B.3679.2(i)

A responsible official of the stationary source shall certify that, based on information and belief formed after reasonable inquiry, the statements made in any document required to be submitted by any condition of the Mercury Operating Permit to Construct are true, accurate and complete.

J. Yearly Reporting. NAC 445B.3679.3(b)(c)(d)

The Permittee will submit yearly reports including, but not limited to, throughput, production, fuel consumption, hours of operation, emissions and mercury co-product. These reports will be submitted on the form provided by the Bureau of Air Quality Planning for all emission units/systems specified on the form. The completed form must be submitted to the Bureau of Air Quality Planning no later than March 1 annually for the preceding calendar year, unless otherwise approved by the Bureau of Air Quality Planning.

K. Facilities Operation. NAC 445B.227

The Permittee may not:

- 1. Operate a stationary source of air pollution unless the control equipment for air pollution that is required by applicable requirements or conditions of the Mercury Operating Permit to Construct are installed and operating.
- 2. Disconnect, alter, modify or remove any of the control equipment for air pollution or modify any procedure required by an applicable requirement or condition of the Mercury Operating Permit to Construct.

L. Excess Emissions. NAC 445B.232

- 1. Scheduled maintenance or testing or scheduled repairs which may result in excess emissions of regulated air pollutants prohibited by NAC 445B.001 to 445B.3689, inclusive, must be approved by the Director and performed during a time designated by the Director as being favorable for atmospheric ventilation.
- 2. The Director must be notified in writing of the time and expected duration at least 24 hours in advance of any scheduled maintenance which may result in excess emissions of regulated air pollutants prohibited by NAC 445B.001 to 445B.3689, inclusive.
- 3. The Director must be notified in writing or by telephone of the time and expected duration at least 24 hours in advance of any scheduled repairs which may result in excess emissions of regulated air pollutants prohibited by NAC 445B.001 to 445B.3689, inclusive.
- 4. The Director must be notified of any excess emissions within 24 hours after any malfunction or upset of the process equipment or equipment for controlling pollution or during startup or shutdown of such equipment. The telephone number for the notification is (775) 687-9350.
- 5. *The Permittee*, as the owner or operator of an affected facility, shall provide the Director, within 15 days after any malfunction, upset, startup, shutdown, or human error which results in excess emissions, sufficient information to enable the Director to determine the seriousness of the excess emissions. The information must include at least the following:
 - a. The identity of the stack or other point of emission, or both, where the excess emissions occurred.
 - b. The estimated magnitude of the excess emissions expressed in units of the applicable limitation on emission and the operating data and methods used in estimating the magnitude of the excess emissions.
 - c. The time and duration of the excess emissions.
 - d. The identity of the equipment causing the excess emissions.
 - e. If the excess emissions were the result of a malfunction, the steps taken to remedy the malfunction and the steps taken or planned to prevent the recurrence of the malfunction.
 - f. The steps taken to limit the excess emissions.
 - g. Documentation that the equipment for controlling air pollution, process equipment, or processes were at all times maintained and operated, to a maximum extent practicable, in a manner consistent with good practice for minimizing emissions.

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Section I. General Conditions (continued)

M. Construction Requirements. NAC 445B.250

1. Early Reduction Credit (ERC), New, or Modified Thermal Units

The Permittee shall provide the Director written notification of:

- a. The date that construction or reconstruction of an affected facility is commenced, postmarked no later than 30 days after such date. This requirement shall not apply to mass-produced facilities which are purchased in completed form.
- b. The anticipated date of initial startup of an affected facility, postmarked not more than 60 days and not less than 30 days prior to such date.
- c. The actual date of initial startup of an affected facility, postmarked within 15 days after such date.

N. Annual Testing. NAC 445B.3679.3

Before the conclusion of each calendar year, the Permittee shall:

- 1. Conduct and record a Method 29 (or alternative test method approved by the Director) compliance test for mercury on the exhaust stack of **System 01 and System 02** consisting of three valid runs. Each of the three test runs must collect a sample volume of 1.7 dry standard cubic meters (60 dscf) or be conducted for up to two hours in an effort to collect this sample volume (NAC 445B.3679.3).
- 2. Simultaneously, during the Method 29 (or alternative test method approved by the Director) compliance test, conduct and record a material assay from **System 01 and System 02**. One representative sample shall be taken during each test run. Total mercury content shall be determined using EPA Method 7471B (cold vapor atomic adsorption analysis) (or alternative test method approved by the Director) (NAC 445B.3679.3).
- 3. Conduct tests of performance under such conditions as the Director specifies to the operator of the plant based on representative performance of the affected facility. The owner or operator shall make available to the Director such records as may be necessary to determine the conditions of the test of performance. Operations during periods of startup, shutdown and malfunction must not constitute representative conditions of a test of performance unless otherwise specified in the applicable standard (NAC 445B.252.3).
- 4. Give notice to the Director 30 days before the test of performance to allow the Director to have an observer present. A written testing procedure for the test of performance must be submitted to the Director at least 30 days before the test of performance to allow the Director to review the proposed testing procedures (NAC 445B.252.4).
- 5. Furnish the Director within 60 days after completing the performance tests a written and electronic report of the results of the performance tests. All information and analytical results of testing and sampling must be certified as to the truth and accuracy and as to their compliance with NAC 445B.001 to 445B.3689 (NAC 445B.252.8).

O. Annual Reporting.

The Permittee shall:

- 1. Report mercury co-product on an annual basis (NAC 445B.3679(3)(d)).
- 2. Report the level of mercury emissions on an annual basis which must be based on mercury emissions test data (NAC 445B.3679(3)(c)).

P. Expiration and Extension. NAC 445B.3687

- 1. If construction will occur in one phase, a mercury operating permit to construct for a new or modified thermal unit that emits mercury expires if construction is not commenced within 18 months after the date of issuance thereof or construction of the thermal unit that emits mercury is delayed for 18 months after initiated. The Director may extend the date on which the construction may be commenced upon a showing that the extension is justified.
- 2. If construction will occur in more than one phase, the projected date of the commencement of construction of each phase of construction must be approved by the Director. A mercury operating permit to construct expires if the initial phase of construction is not commenced within 18 months after the projected date of the commencement of construction approved by the Director. The Director may extend only the date on which the initial phase of construction may be commenced upon a showing that the extension is justified.

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******* End of General Conditions *********

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Section II. Specific Operating Conditions

A. Thermal Unit #TU 4.001 location North 4,526.99 km, East 358.93 km, UTM (Zone 11)

A. System 01 – Mercury Retort		
TU	4.001	Mercury Retort , manufactured by Summit Valley Equipment & Engineering, LLC., model number 40MR1E

1. Air Pollution Equipment

- a. Exhaust gases from TU 4.001 shall be ducted to a control system with 100% capture consisting of:
 - i. Mercury Condenser (MC-001), manufactured by Summit Valley Equipment & Engineering, LLC.
 - ii. **Sulfur-Impregnated Carbon Adsorption Bed** (**CA-001**), manufactured by Summit Valley Equipment & Engineering, LLC.

b. Stack Parameters

i. Height: 12.6 ftii. Diameter: 0.5 ft

iii. Stack temperature: 80°F

- iv. Flow: Maximum volume flow rate of 107 actual cubic feet per minute (acfm).
- v. **TU 4.001** is ducted to a single stack.

2. Construction Requirements (NAC 445B.250)

The *Permittee* shall provide the Director written notification of:

- a. The date that construction of TU 4.001 is commenced, postmarked no later than 30 days after such date.
- b. The anticipated date of initial startup of **TU 4.001**, postmarked not more than 60 days and not less than 30 days prior to such date.
- c. The actual date of initial startup of **TU 4.001**, postmarked within 15 days after such date.

3. Operating Requirements

- a. <u>Limitations of Operation</u> NAC 445B.3679.3
 - i. The maximum allowable throughput rate of **Zinc Precipitate** for **TU 4.001** shall not exceed **2.5 tons per batch**.
 - ii. Mercury emissions from TU4.001 shall not exceed 5.0 x 10⁻⁵ grains per dry standard cubic foot (gr/dscf).
 - iii Hours
 - (a) TU 4.001 may operate a total of 24 hours per day.
 - (b) **TU 4.001** may operate a total of 6,240 hours per calendar year.

b. Work Practice Standards NAC 445B.3679.3

- i. During heating TU 4.001 shall be placed under negative gauge pressure between 200 to 350 mmHg.
- ii. The maximum exhaust gas temperature at the discharge of MC-001 for TU 4.001 shall not exceed 110°F.
- iii. The water flow rate entering MC-001 shall be maintained at or above 59 gallons per minute.
- iv. Condensed mercury from MC-001 shall be collected monthly.
- v. **CA-001** shall contain no less than 550 pounds of sulfur-impregnated carbon.
- vi. The pressure differential across CA-001 shall not exceed 12.85 inches of water
- vii. The water temperature entering MC-001 shall be maintained at or below 40°F.
- viii. Zinc precipitate shall be retorted in pans specified by the retort manufacturer and not exceed the volume capacity specified by the manufacturer, per pan.

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Section II. Specific Operating Conditions (continued)

A. Thermal Unit #TU 4.001 (continued)

- ix. Replace the sulfur-impregnated carbon according to the following schedule:
 - (a) Conduct an initial sampling of the sulfur-impregnated carbon every calendar quarter. A representative sample shall be taken and analyzed. The depth of the sample location shall be recorded. Using this sample the percentage of mercury by weight shall be calculated. Sampling will continue quarterly, at the same sample depth location, until 70 % of the 20% by weight of the carbon loading capacity, as specified by the manufacturer, is reached. Upon reaching 70% of the 20% by weight of the carbon loading capacity, sampling of the carbon will occur monthly until 75% of the 20% by weight of the carbon loading capacity is reached. The carbon will be replaced with an equivalent performing sulfur impregnated carbon no later than 30 days after reaching 75% of the 20% by weight of the carbon loading capacity. The required mercury analysis shall be performed utilizing one of the following methods:
 - 1. EPA method 6020-Inductively Coupled Plasma-Mass Spectrometry;
 - 2. EPA method 7471B- Mercury in Solid or Semisolid Waste (Manual Cold-Vapor Technique); or
 - 3. An alternative test method as approved by the Director.
- x. Any sulfur impregnated carbon replaced in **CA-001** shall be replaced with only the original manufacturer's design specification sulfur impregnated carbon.

4. Compliance, Monitoring, Recordkeeping and Testing (NAC 445B.3379.3)

a. Compliance/Performance Testing

Within 60 days of the notification of initial startup of **TU 4.001** as required in A.2.a through c, of this section, **the** *Permitee* shall conduct and record a performance test for mercury on the exhaust stack of **TU 4.001** consisting of three valid runs utilizing US EPA Method 29 of 40 CFR part 60 Appendix A.

b. Monitoring

The *Permittee*, upon issuance date of this permit, for TU4.001 shall:

- i. Prior to commencement of **TU 4.001**, install, operate, calibrate, and maintain instrumentation to measure the following:
 - (a) The negative gauge pressure of **TU 4.001**, in mmHg.
 - (b) The outlet gas temperature for MC-001, in degrees Fahrenheit.
 - (c) The water flow rate to MC-001, in gallons per minute.
 - (d) The pressure drop across CA-001, in inches of water.
 - (e) The temperature of the water entering MC-001, in degrees Fahrenheit.
- ii. Prior to commencement of **TU 4.001** install, operate, calibrate, and maintain a vacuum interlock that will shut off the retort heating element if the retort gauge pressure equals 200 mmHg of vacuum or less.
- iii. Prior to commencement of **TU 4.001** install, operate, calibrate, and maintain a condenser water flow interlock which will shut off the retort heating element if condenser water flow is not present.
- iv. Monitor the daily batch weight of **Zinc Precipitate**, in tons, for each batch.
- v. Monitor the hours of operation during each day of operation, for each batch.
- vi. Monitor the gauge pressure on TU 4.001, once per batch during operation.
- vii. Monitor the outlet gas temperature of MC-001 of TU 4.001, once per batch during operation.
- viii. Monitor the water flow rate to MC-001, once per batch during operation.
- ix. Monitor the inlet water temperature of MC-001, once per batch during operation.
- x. Monitor the mercury drained from MC-001, monthly.
- xi. Monitor the pressure drop across **CA-001**, once per batch during operation.
- xii. Monitor **CA-001** for percentage of mercury by weight, quarterly until reaching 70 percent capacity and then monthly until reaching 75 percent capacity.

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Section II. Specific Operating Conditions (continued)

A. Thermal Unit #TU 4.001 (continued)

c. Recordkeeping

The required monitoring, established in Section A.4.b.i through xii., shall be maintained in a contemporaneous log containing, at a minimum, the following recordkeeping:

- i. The calendar date of any required monitoring.
- ii. The total daily batch weight of **Zinc Precipitate** per batch, in tons, for the corresponding date.
- iii. The total daily operating hours per batch, for the corresponding date.
- iv. The gauge pressure on **TU 4.001** per batch, during operation, for the corresponding date.
- v. The outlet gas temperature of MC-001 per batch, during operation, for the corresponding date.
- vi. The condenser water temperature entering MC-001 per batch, during operation, for the corresponding date.
- vii. The water flow rate to MC-001 per batch, during operation, for the corresponding date.
- viii. The amount of mercury collected from MC-001, in pounds, monthly, for the corresponding date.
- ix. The pressure drop across CA-001 per batch, during operation, for the corresponding date.
- x. The percentage of mercury by weight in the sulfur-impregnated carbon, for the corresponding date.
- xi. The depth of the sample location, for the corresponding date
- xii. The date, time, and weight of each replacement of the sulfur-impregnated carbon bed.
- xiii. The original manufacturer's design specifications for the sulfur impregnated carbon used in **CA-001** shall be kept on site.
- xiv. The manufacturer's specified heating temperature profile for TU4.001 shall be kept on site.



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Section II. Specific Operating Conditions (continued)

B. Thermal Unit #TU 4.002 location North 4,526.99 km, East 358.93 km, UTM (Zone 11)

В. :	3. System 02 – Furnace	
TU	4.002	Smelting Furnace, manufactured by Summit Valley Equipment & Engineering, LLC., model number MF 101

1. Air Pollution Equipment

- a. Exhaust gases from TU 4.002 shall be ducted to a control system with 100% capture consisting of:
 - i. Baghouse (BH-001), manufactured by MCNS.
 - Sulfur-Impregnated Carbon Scrubber (CA-002), manufactured by Summit Valley Equipment & Engineering, LLC.

b. Stack Parameters

- i. Height: 6 ft.
- ii. Diameter: 1 ft.
- iii. Stack temperature: 80°F
- iv. Flow: Maximum volume flow rate of 7,200 actual cubic feet per minute (acfm).
- v. TU 4.002 is ducted to a single stack.

2. Construction Requirements (NAC 445B.250)

The *Permittee* shall provide the Director written notification of:

- a. The date that construction of **TU 4.002** is commenced, postmarked no later than 30 days after such date.
- b. The anticipated date of initial startup of **TU 4.002**, postmarked not more than 60 days and not less than 30 days prior to such date.
- c. The actual date of initial startup of TU 4.002, postmarked within 15 days after such date.

3. Operating Requirements

- a. <u>Limitations of Operation</u>. NAC 445B.3679.3
 - i. The maximum allowable throughput rate of **Retorted Zinc Precipitate** for **TU 4.002** shall not exceed **2.4 tons per batch for a 12 hour period**, nor more than **1,248 tons per year**.
 - ii. Mercury emissions from TU 4.002 shall not exceed 5.0 x 10⁻⁶ grains per dry standard cubic foot (gr/dscf).
 - iii. Hours
 - (a) TU 4.002 may operate a total of 24 hours per day.
 - (b) **TU 4.002** may operate a total of 6,240 hours per calendar year.

b. Work Practice Standards NAC 445B.3679.3

- i. Only Zinc Precipitate that has been retorted shall be fed into TU 4.002.
- ii. The pressure differential across **BH-001** shall be maintained within the manufacturer's specified operating range of 2 to 6 inches of water.
- iii. The pressure differential across **CA-002** shall be maintained within the manufacturer's specified operating range of 9 to 12 inches of water.
- iv. The temperature at the inlet of CA-002 shall be maintained at or below 275°F.
- v. **CA-002** shall contain no less than 21,600 pounds of sulfur-impregnated carbon.

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Section II. Specific Operating Conditions (continued)

B. Thermal Unit #TU 4.002 (continued)

- vi. Replace the sulfur-impregnated carbon in CA-002 according to the following schedule:
 - (a) Conduct an initial sampling of the sulfur-impregnated carbon every calendar quarter. A representative sample shall be taken and analyzed. The depth of the sample location shall be recorded. Using this sample the percentage of mercury by weight shall be calculated. Sampling will continue quarterly, at the same sample depth location, until 70% of the 20% by weight of the carbon loading capacity, as specified by the manufacturer, is reached. Upon reaching 70% of the 20% by weight of the carbon loading capacity, sampling of the carbon will occur monthly until 75% of the 20% by weight of the carbon loading capacity is reached. The carbon will be replaced with an equivalent performing sulfur impregnated carbon no later than 30 days after reaching 75% of the 20% by weight of the carbon loading capacity. The required mercury analysis shall be performed utilizing one of the following methods:
 - 1. EPA method 6020-Inductively Coupled Plasma-Mass Spectrometry;
 - 2. EPA method 7471B- Mercury in Solid or Semisolid Waste (Manual Cold-Vapor Technique); or
 - 3. An alternative test method as approved by the Director.
- vii. Any sulfur impregnated carbon replaced in **CA-002** shall be replaced with only the original manufacturer's design specification sulfur impregnated carbon.

4. Compliance, Monitoring, Recordkeeping and Testing (NAC 445B.3379.3)

a. Compliance/Performance Testing

Within 60 days of the notification of initial startup of **TU 4.002** as required in B.2.a through c, of this section, **the** *Permitee* shall conduct and record a performance test for mercury on the exhaust stack of **TU 4.002** consisting of three valid runs utilizing US EPA Method 29 of 40 CFR part 60 Appendix A.

b. Monitoring

The Permittee, upon the issuance date of this permit, for TU 4.002, shall:

- i. Prior to commencement of **TU 4.002** install, operate, calibrate, and maintain instrumentation to measure the following:
 - (a) The pressure drop across BH-001 of TU 4.002, in inches of water.
 - (b) The inlet temperature of **CA-002**, in degrees Fahrenheit.
 - (c) The pressure drop across **CA-002**, in inches of water.
- ii. Monitor the batch weight of **Retorted Zinc Precipitate** in tons.
- iii. Monitor the hours of operation of TU 4.002 during each day of operation.
- iv. Monitor the pressure drop of **BH-001**, once per batch during operation.
- v. Monitor the inlet temperature of **CA-002**, once per batch during operation.
- vi. Monitor the pressure differential across CA-002, once per batch during operation.
- vii. Monitor the sulfur-impregnated carbon in **CA-002** for percentage of mercury by weight, quarterly until reaching 70 percent capacity then monthly until reaching 75 percent.

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Section II. Specific Operating Conditions (continued)

B. Thermal Unit #TU 4.002 (continued)

Recordkeeping

The required monitoring, established in Section B.4.b.i through vii, shall be maintained in a contemporaneous log containing, at a minimum, the following recordkeeping:

- i. The calendar date of any required monitoring.
- ii. The total daily batch weight of Retorted Zinc Precipitate, in tons, for the corresponding date.
- iii. The total daily operating hours, for the corresponding date.
- iv. The pressure drop across BH-001, during operation, for the corresponding date.
- v. The inlet temperature of **CA-002**, during operation, for the corresponding date.
- vi. The pressure drop across CA-002, during operation, for the corresponding date.
- vii. The percentage of mercury by weight in the sulfur-impregnated carbon in CA-002, for the corresponding date.
- viii. The depth of the sample location, for the corresponding date.
- ix. The date, time, and weight of each replacement of the sulfur-impregnated carbon.
- x. The original manufacturers design specifications for the sulfur impregnated carbon used in CA-002 shall be kept on site.

******* End of Specific Operating Conditions *********



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Section III. Amendments



- 1. Is non-transferable. (NAC 445B.287.3)
- 2. Will be posted conspicuously at or near the stationary source. (NAC 445B.318.5)
- 3. Any party aggrieved by the Department's decision to issue this permit may appeal to the State Environmental Commission (SEC) within ten days after the date of notice of the Department's action. (NRS 445B.340)

Signature	
Issued by:	Rob Bamford
	Supervisor, Permitting Branch
	Bureau of Air Quality Planning

Phone: (775) 687-9330 Date:

rb 03/26